

# EXHIBIT B

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**FBI Laboratory**

2501 Investigation Parkway  
Quantico, Virginia 22135

**REPORT OF EXAMINATION**

CCO:

To: Boston  
BS-C3  
Kristin Koch

Date: December 17, 2013

Case ID No.: 415M-BS-2814367 - 11017

Lab No.: 130416021 AAR AAL  
130418012 AAR AAL  
130420100 AAR AAL  
130421100 AAR AAL  
130423010 AAR AAL  
130423012 AAR AAL  
130424003 AAR AAL  
130425018 AAR AAL

Reference: Communications dated April 19, 2013, April 23, 2013, April 25, 2013, and April 27, 2013

Your No.:

Title: UNSUBS;  
4/15/2013 Boston Marathon Bombing  
IT

Date specimens received: April 17-21, 2013, and April 23-25, 2013

The items listed below were submitted under cover of communication dated April 19, 2013, assigned Laboratory number 130416021, and received in the Chemistry Unit Paints and Polymers Subunit:

**THE FOLLOWING ITEMS WERE RECEIVED AT THE FBI LABORATORY ON  
APRIL 17, 2013 (SUBMISSION 1):**

**BOYLSTON STREET, SCENE 1 (SCENE A)**

Q39.1-Q39.2 Tape from Q39 wires and circuit board (Your S42, E5180270)

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**BOYLSTON STREET, SCENE 2 (SCENE B)**

Q42.1-Q42.6	Tape from Q42 device components and battery (Your S2027, E5180260)
Q42.7	Tape from Q42 device components and battery (Your S2027, E5180260)
Q44.1-Q44.2	Tape from Q44 metal device component (Your S2031, E5180262)
Q52.1-Q52.5	Tape from Q52 electrical components (Your S2099, E5180258)
Q52.6	One (1) hexagonal shaped piece of unknown material (Your S2099, E5180258)

**THE FOLLOWING ITEMS WERE RECEIVED AT THE FBI LABORATORY ON  
APRIL 17, 2013 (SUBMISSION 2):**

**BOYLSTON STREET, SCENE 1 (SCENE A)**

Q53.1	Tape from Q53 pressure cooker bottom metal plate (Your S101, E5180330)
Q74	Black tape (Your S31, E5180323)
Q76	Unknown material (Your S33, E5180325)
Q77	Black tape (Your S34, E5180394)
Q79	Duct tape (Your S36, E5180392)
Q86	Black tape (Your S45, E5180313)
Q91	Duct tape (Your S50, E5180308)
Q91.1	Duct tape (Your S50, E5180308)
Q91.2	Duct tape (Your S50, E5180308)
Q91.3	Duct tape (Your S50, E5180308)
Q104	One (1) piece of black electrical tape with fibers (Your S63, E5180295)
Q104.1	One (1) piece of silver colored duct tape (Your S63, E5180295)
Q104.2	One (1) piece of black tape (Your S63, E5180295)

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Q108.1 One (1) piece of duct tape from Q108 piece of cardboard (Your S67, E5180291)

Q108.2 One (1) piece of duct tape from Q108 piece of cardboard (Your S67, E5180291)

**THE FOLLOWING ITEMS WERE RECEIVED AT THE FBI LABORATORY ON  
APRIL 18, 2013 (SUBMISSION 1):**

**BOYLSTON STREET, SCENE 2 (SCENE B)**

Q125.1 Tape from Q125 cardboard (Your S2053, E5180375)

Q125.3 Tape from Q125 cardboard (Your S2053, E5180375)

Q125.3.1 Piece of tape from Q125.3 (Your S2053, E5180375)

Q129.3 Sampling of unknown material from Q129 BBs (Your S2045, E5180379)

Q130.1 Tape from Q130 green hobby fuse (Your S2086, E5180356)

Q131.1 Tape from Q131 backpack fragments (Your S2143, E5180435)

Q146.1 Tape from Q146 metal piece (Your S2021, E5180333)

Q151.1 Tape from Q151 cardboard (Your S2028, E5180334)

Q151.1.1 Piece of tape isolated from Q151.1 (Your S2028, E5180334)

Q151.2 Tape from Q151 cardboard (Your S2028, E5180334)

Q151.2.1 Piece of tape isolated from Q151.2 (Your S2028, E5180334)

Q157.1 Tape from Q157 BBs, etc. (Your S2093, E5180355)

Q157.3 Sampling of unknown material from Q157 BBs, etc. (Your S2093, E5180355)

Q158.1 Tape from Q158 fabric fragments (Your S2115, E5180365)

Q162-Q162.1 Duct tape (Your S2114, E5180345)

Q167.6.1 Tape from Q167.6 piece of paper (Your S2110, E5180348)

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**BOYLSTON STREET, SCENE 1 (SCENE A)**

Q171.1	Tape from Q171 wires, etc. (Your S110, E5180340)
Q183.1	Tape from Q183 burned cardboard fragments and BB (Your S131, E5180454)
Q183.1.2	Piece of tape isolated from Q183.1 (Your S131, E5180454)
Q183.2	Tape from Q183 burned cardboard fragments and BB (Your S131, E5180454)
Q185.1	Tape from Q185 piece of cardboard (Your S132, E5180455)
Q190.1	Tape from Q190 pieces of green insulated wire (Your S84, E5180445)
Q191.1	Tape from Q191 cardboard (Your S115, E5180448)
Q192.1	Tape from Q192 green hobby fuse (Your S83, E5180444)
Q195.1	Tape from Q195 pieces of green insulated wire, etc. (Your S121, E5180449)
Q199.1-Q199.25	Tape from Q199 cardboard pieces (Your S103, E5180415)
Q199.31- Q199.34	Duct tape from Q199 cardboard pieces (Your S103, E5180415)
Q208.1	Tape from Q208 battery wrapper and BB (Your S120, E5180429)
Q209.3	Tape from Q209 BBs (Your S123, E5180417)

The items listed below were submitted under cover of communication dated April 23, 2013, assigned Laboratory number 130418012, and examined in the Chemistry Unit Paints and Polymers Subunit:

**THE FOLLOWING SPECIMENS WERE RECEIVED BY THE FBI LABORATORY ON APRIL 18, 2013:**

**SCENE 2 (SCENE B)**

Q227.1	Tape from Q227 fabric, etc. (Your S2179, E5182291)
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- Q227.1.1 Piece of tape isolated from Q227.1 (Your S2179, E5182291)
- Q231.1 Tape from Q231 wires (Your S2184, E5182278)
- Q255.1 Tape from Q255 fabric and cardboard (Your S2198, E5182222)

**THE FOLLOWING SPECIMENS WERE RECEIVED BY THE FBI LABORATORY ON APRIL 19, 2013:**

**MEDICAL EXAMINER'S OFFICE**

- Q268.1.1 Tape from Q268.1 debris (Your ME7, E5182423)
- Q268.1.1.1 Piece of tape from Q268.1.1 (Your ME7, E5182423)
- Q268.1.2 Tape from Q268.1 debris (Your ME7, E5182423)

**SCENE 2 (SCENE B)**

- Q276.1 Tape from Q276 clothing and cardboard (Your S2233, E5182362)
- Q283 Black tape (Your S2287, E5182477)
- Q291.1 Tape from Q291 rocks (Your S2282, E5182475)
- Q293.1-Q293.3 Tape from Q293 cardboard and debris (Your S2234, E5182359)
- Q296.1-Q296.2 Tape from Q296 plastic pieces (Your S2302, E5182471)
- Q301.1-Q301.2 Tape from Q301 rocks (Your S2289, E5182476)

**SCENE 1 (SCENE A)**

- Q306.1 Tape from Q306 cardboard (Your S144, E5182353)
- Q324.1 Tape from Q324 metal terminal (Your S183, E5182345)
- Q330.1 Tape from Q330 battery cover and portion of battery cover (Your S220, E5182450)
- Q392.1 Tape from Q392 BBs and debris (Your S170, E5180579)
- Q394.1 Tape from Q394 BBs (Your S165, E5180584)

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Q405.2 Tape from Q405 BBs and debris (Your S181, E5180578)  
Q433.1 Tape from Q433 cardboard (Your S356, E5182511)  
Q438.1-Q438.2 Tape from Q438 wires and metal (Your S311, E5182505)  
Q444.1-Q444.2 Tape from Q444 (Your S128, E5182158)  
Q458 Tape (Your S128, E5182158)  
Q458.1 Piece of tape isolated from Q458 (Your S128, E5182158)  
Q460.1 Tape from Q460 BBs (Your S81, E5182182)  
Q460.1.1 Piece of tape from Q460.1 (Your S81, E5182182)

**SCENE 2 (SCENE B)**

Q480.1 Tape from Q480 fabric and zipper (Your S2140, E5182185)  
Q486.1 Tape from Q486 cardboard (Your S2103, E5182196)  
Q510.1 Tape from Q510 foam and fabric (Your S2235, E5182368)  
Q543.1 Tape from Q543 fabric and zipper (Your S2201, E5182272)  
Q546.1 Tape from Q546 cardboard and glass (Your S2177, E5182320)  
Q556.1 Tape from Q556 fabric and zipper (Your S2131, E5182224)

The items listed below were submitted under cover of communication dated April 23, 2013, assigned Laboratory number 130420100, and examined in the Chemistry Unit Paints and Polymers Subunit:

**THE FOLLOWING SPECIMENS WERE RECEIVED BY THE FBI LABORATORY ON APRIL 20, 2013:**

**The following specimens were obtained from 61 LAUREL ST:**

Q575.1 Nine (9) pieces of tape from Q575 transmitter, etc. (1B826, E5180946)



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Q582.1	Tape from Q582 switch (1B845, E5180944)
Q583.1	Tape from Q583 metal end cap, etc. (Item #1W17, E5181155)
Q583.2	Tape from Q583 metal end cap, etc. (Item #1W17, E5181155)
Q584.2	Tape from Q584 metal end cap, etc. (Item #1W21, E5181159)
Q584.3	Tape from Q584 metal end cap, etc. (Item #1W21, E5181159)

**The following specimens were from Laurel Street and received in the FBI Laboratory on April 21, 2013:**

Q603.1	Tape from Q603 pieces of green insulated wire (Your #1W-47, E5179261)
Q604	Tape (Your #1W-46, E5179260)
Q612.1	Tape from Q612 pieces of green insulated wire (Your #1W-29, E5179243)
Q635.2	Tape from Q635 BBs, etc. (Your #1W-72, E5179286)
Q641.1	Tape from Q641 wire (Your #1W-80, E5179294)
Q643	Black tape (Your #1W-97, E5179303)
Q647	Black tape (Your #1W-102, E5179298)
Q656	Black tape (Your #1W-101, E5179299)

The items listed below were submitted under cover of communication dated April 25, 2013, assigned Laboratory number 130421100, and examined in the Chemistry Unit Paints and Polymers Subunit:

**THE FOLLOWING SPECIMENS WERE RECEIVED BY THE FBI LABORATORY ON APRIL 21, 2013:**

**Items from residence, 410 Norfolk Street, Apt. 3, Cambridge, MA:**

Q680.1	One (1) roll of tape (Your 1B1337, E5179184)
Q684.2	Roll of tape (Your 1B1289, E5179185)

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Q685.2 Priority mail shipping tape (Your 1B1280, E5179106)  
Q686 Roll of clear tape (Your 1B1272, E5179116)  
Q693 One (1) roll of silver-colored duct-type tape (Your 1B1268, E5179119)  
Q693.1 One (1) roll of silver-colored duct-type tape (Your 1B1268, E5179119)  
Q695 Roll of tape (Your 1B1271, E5179115)  
Q702 One (1) bottle of Gorilla brand glue (Your 1B1306, E5179170)  
Q725.4 One (1) spool of PTFE thread seal tape (Your 1B1352, E5179153)  
Q725.5 Roll of duct tape (Your 1B1352, E5179153)  
Q725.6 Roll of black tape (Your 1B1352, E5179153)

**Items from Dorm room at Dartmouth:**

Q737 Roll of tape (Your 1B1564, E5179235)  
Q743.1-Q743.4 Tape from Q743 power cord (Your 1B1551, E5179221)

The items listed below were submitted under cover of communication dated April 23, 2013, assigned Laboratory number 130423010, and examined in the Chemistry Unit Paints and Polymers Subunit:

**THE FOLLOWING SPECIMENS WERE RECEIVED AT THE FBI LABORATORY ON APRIL 23, 2013:**

**Acquired from 69A Carriage, New Bedford, Mass:**

Q764.1.1 Tape from Q764.1 pliers (1B2040, E5179517)

**Acquired from alley behind 283 Broadway, Cambridge, MA:**

Q771 Roll of black electrical tape (1B2044, E5179522)

**Acquired from sidewalk in front of 665 Boylston Street (Scene A/1):**

Q779 Three (3) pieces of black tape (S465, E5182712)

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The items listed below were submitted under cover of communication dated April 24, 2013, assigned Laboratory number 130423012, and examined in the Chemistry Unit Paints and Polymers Subunit:

**THE FOLLOWING SPECIMENS WERE RECEIVED AT THE FBI LABORATORY ON APRIL 23, 2013:**

**Acquired from the intersection of Lincoln and Spruce, Watertown, MA:**

Q781.3                      Tape from Q781 plastic container and hobby fuse (E5182413)  
Q781.3.1                    Piece of tape from Q781.3 (E5182413)

The items listed below were submitted under cover of communication dated April 27, 2013, assigned Laboratory number 130424003, and examined in the Chemistry Unit Paints and Polymers Subunit:

**THE FOLLOWING SPECIMENS WERE RECEIVED AT THE FBI LABORATORY ON 04/24/2013:**

**Acquired from 32 Vassar Street, Cambridge, MA:**

Q792      One (1) roll of TaegaSeal PTFE tape (1B2248, E5179571)  
Q792.1    One (1) roll of TaegaSeal PTFE tape (1B2248, E5179571)  
Q792.2    One (1) roll of T.F.E tape (1B2248, E5179571)  
Q792.3    One (1) roll of T.F.E tape (1B2248, E5179571)

The items listed below were submitted under cover of communication dated April 27, 2013, assigned Laboratory number 130425018, and examined in the Chemistry Unit Paints and Polymers Subunit:

**THE FOLLOWING SPECIMENS WERE RECEIVED AT THE FBI LABORATORY ON 04/25/2013:**

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**Acquired from 1084 Belmont Street, Watertown, MA:**

- Q850.1 Tape from Q850 cardboard tubes (Item # 4W2B, E5754007)
- Q852 Black trash bag, white plastic bags, tape and debris (4W2D, E5754009)
- Q852.1 Tape from Q852 (4W2D, E5754009)

This report contains the results of the requested tape examinations. Additionally, it supplements the Chemistry Unit polymer report dated July 24, 2013 in that one additional polymer item (Q702) was examined, and additional examinations were conducted on Q129.3 and Q157.3 for the purposes of the tape comparisons.

**Results of Examinations:**

Multiple categories of tape were found amongst the items listed above. They included duct tapes, electrical tapes, packaging tapes, polytetrafluoroethylene (PTFE) tapes, friction tapes, and paper tapes.

Tapes recovered from Scene A included multiple types of duct tape, multiple types of electrical tape, packaging tape, and friction tape. Tape recovered from Scene B included multiple types of duct tape, multiple types of electrical tape, packaging tape, and paper tape. Tapes recovered from Laurel Street included electrical tape, packaging tape, and PTFE tape. A variety of other tapes were recovered from the various other locations searched.

Items within each category of tape were examined and compared between the various crime scenes and search locations.

*Duct Tape Examinations*

Duct tapes are comprised of three constituents: a polymeric backing, an adhesive, and a fabric between the backing and adhesive. Comparative examinations of duct tapes involve analysis of these constituents by the Chemistry Unit with further comparison of the fabric portion conducted by the Trace Evidence Unit. Of the duct tapes received in the Chemistry Unit, some were silver and some were black. Those of like color were compared further.

The following items were silver duct tapes: Q79, Q91-Q91.3, Q104.1, Q108.1-Q108.2, Q125.1, Q151.1, Q157.1, Q158.1, Q162.1, Q183.1, Q185.1, Q191.1, Q199.1-QQ199.25, Q199.31-Q199.34, Q255.1, Q268.1.2, Q276.1, Q291.1, Q293.1-Q293.3, Q296.1, Q301.1-Q301.2, Q306.1, Q392.1, Q433.1, Q480.1, Q486.1, Q546.1, Q693, Q693.1, Q725.5, Q737, and

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Q743.1-Q743.4. This list includes items from Scene A, Scene B, the Medical Examiner's Office, the Norfolk Street apartment, and the Dartmouth Dorm Room.

The items from the Norfolk Street apartment (Q693 and Q693.1) and the Dartmouth dorm room (Q737 and Q743.1-Q743.4) differ in physical characteristics from all the silver duct tapes associated with Scene A, Scene B, and the Medical Examiner's Office. Therefore, Q693, Q693.1, Q737, and Q743.1-Q743.4 can all be excluded as the source of any of the pieces from Scene A, Scene B, and the Medical Examiner's Office (*Elimination*).

Additionally, the Q725.5 roll of silver duct tape from the Norfolk Street apartment differs in physical characteristics from the Q79, Q91-Q91.3, Q104.1, Q291.1, and Q301.1-Q301.2 pieces of tape. Therefore, none of these pieces originated from Q725.5 (*Elimination*). Further, of the Q79, Q91-Q91.3, Q104.1, Q291.1, and Q301.1-Q301.2 items, only Q79 and Q91-Q91.3 were similar, but since they were both collected from Scene A, they were not comprehensively compared to each other.

However, Q725.5 is similar in physical characteristics to the following items from Scene A, Scene B, and the Medical Examiner's Office: Q108.1-Q108.2, Q125.1, Q151.1, Q157.1, Q158.1, Q162.1, Q183.1, Q185.1, Q191.1, Q199.1-Q199.25, Q199.31-Q199.34, Q255.1, Q268.1.2, Q276.1, Q293.1-Q293.3, Q296.1, Q306.1, Q392.1, Q433.1, Q480.1, Q486.1, and Q546.1. If the tapes contained suitable ends, they were compared to the free end of the Q725.5 roll of tape. However, no end matches were observed.

Q151.1.1 was isolated from Q151.1 and chosen as representative of Scene B; Q183.1.2 was isolated from Q183.1 and chosen as representative of Scene A. Q151.1.1 and Q183.1.2 were then fully characterized and compared to Q725.5. Based on these examinations, Q151.1.1, Q183.1.2, and Q725.5 are indistinguishable in physical characteristics and chemical composition. Therefore, Q151.1.1 and Q183.1.2 originated from the Q725.5 partial roll of silver Ace All Purpose duct tape or another roll(s) manufactured in the same manner (*Level III Association*). This conclusion was reached because other rolls of tape produced at the same manufacturing plant and with the same specifications would also be indistinguishable from this roll. Further, rolls like Q725.5 are readily available in the marketplace.

Additionally, Q725.5 cannot be excluded as a possible source of the Q268.1.2 (the sole duct tape from the Medical Examiner's office) (*Level IV Association*), but due to the size and condition of Q268.1.2, a comprehensive examination and comparison could not be conducted.

As a result of the reported associations, Q151.1.1, Q183.1.2, Q268.1.2, and Q725.5 are being forwarded to the Trace Evidence Unit to determine if any differences exist between the fabric portions of these tapes. The results of those examinations will be the subject of a subsequent communication.

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The following items were black duct tapes: Q52.5, Q53.1, Q86, Q104.2, Q131.1, Q151.2, Q162, Q227.1.1, Q296.2, Q444.1, Q458, Q510.1, and Q725.6. This list includes items from Scene A, Scene B, and the Norfolk Street apartment.

Q104.2 and Q444.1 differ physically from each other and from the other black duct tapes and therefore originate from different sources than the other black duct tapes (*Elimination*).

The remaining black duct tapes were generally similar in physical characteristics. If the tapes contained suitable ends, they were compared to the free end of the Q725.6 roll of tape from the Norfolk Street apartment. However, no end matches were observed.

Q151.2.1 was isolated from Q151.2 and chosen as representative of Scene B; Q458.1 was isolated from Q458 and chosen as representative of Scene A. Q151.2.1 and Q458.1 were then fully characterized and compared to Q725.6. Based on these examinations, Q151.2.1, Q458.1, and Q725.6 are indistinguishable in physical characteristics and chemical composition. Therefore, Q151.2.1 and Q458.1 originated from the Q725.6 partial roll of black Gorilla tape or another roll(s) manufactured in the same manner (*Level III Association*). This conclusion was reached because other rolls of tape produced at the same manufacturing plant and with the same specifications would also be indistinguishable from this roll. Further, rolls like Q725.6 are readily available in the marketplace.

As described for the silver duct tapes, Q151.2.1, Q458.1, and Q725.6 are being forwarded to the Trace Evidence Unit. The results of those examinations will be the subject of a subsequent communication.

The following analytical techniques were utilized in the examination of the duct tapes: visual and stereomicroscopical observations, physical measurements, Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM/EDS), and X-ray diffractometry (XRD).

#### *Electrical Tape Examinations*

Electrical tapes are comprised of two constituents: a plasticized polymeric backing and an adhesive. While all of the electrical tapes examined had black backings, some had clear, colorless adhesives and others had black adhesives. Those with like-colored adhesives were compared further.

The following items had clear, colorless adhesives: the Q77, Q283, Q330.1, Q444.2, and Q764.1.1 pieces of tape as well as the Q771 roll of tape. This list includes items from Scene A, Scene B, New Bedford, and an alley in Cambridge. Each of the items was physically and/or chemically different from each of the others. Therefore, none of these items originated from the same roll of tape as each other, to include Q771 (*Elimination*).



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The following items had black adhesives: Q39.1-Q39.2, Q42.1-Q42.6, Q44.1-Q44.2, Q52.1-Q52.4, Q104, Q130.1, Q146.1, Q171.1, Q190.1, Q192.1, Q195.1, Q208.1, Q231.1, Q324.1, Q438.1-Q438.2, Q543.1, Q556.1, Q575.1, Q582.1, Q583.1, Q584.2, Q603.1, Q604, Q612.1, Q641.1, Q643, Q647, Q656, and Q781.3. This list includes items from Scene A, Scene B, Laurel Street, and the intersection of Lincoln and Spruce in Watertown. All of these tapes were generally similar in physical characteristics. However, Q104 differed from the rest in chemical composition. Therefore, it does not share a common source with any of the others listed (*Elimination*).

If the tapes listed from Scenes A, B, and Laurel Street contained suitable ends, the suitable ends were compared to the free ends of the pieces of Q781.3 from Watertown. No end matches were observed.

Representative specimens from each scene were selected for further comparison. Q39.1 was chosen from Scene A, Q556.1 was chosen from Scene B, Q583.1 was chosen from Laurel Street, and Q781.3.1 was isolated from Q781.3. Based on these examinations, Q39.1, Q556.1, Q583.1, and Q781.3.1 are indistinguishable in physical characteristics and chemical composition. Therefore, Q39.1, Q556.1, Q583.1, and Q781.3.1 originated from the same roll of black electrical tape or different rolls manufactured in the same manner (*Level III Association*). This conclusion was reached because other rolls of tape produced at the same manufacturing plant and with the same specifications would also be indistinguishable from these items. Further, this type of tape would be readily available in the marketplace.

The following analytical techniques were utilized in the examination of the electrical tapes: visual and stereomicroscopical observations, physical measurements, FTIR, SEM/EDS, and pyrolysis-gas chromatography/mass spectrometry (py-GC/MS).

#### *Packaging Tape Examinations*

Packaging tapes are comprised of two constituents: a polymeric backing and an adhesive. They are generally clear/colorless or brown/tan in color. All the packaging tapes listed here were clear/colorless.

The following items were packaging tapes: Q125.3, Q129.3, Q157.3, Q167.6.1, Q183.2, Q209.3, Q227.1, Q268.1.1, Q394.1, Q405.2, Q460.1, Q635.2, Q684.2, Q685.2, Q686, Q695, Q850.1, and Q852.1. This list includes items from Scene A, Scene B, the Medical Examiner's office, Laurel Street, the Norfolk Street apartment, and Belmont Street in Watertown.

The items listed as collected from Scene A, Scene B, and Laurel Street differ in appearance from the Q685.2 roll from the Norfolk Street apartment. Therefore, they did not originate from Q685.2 (*Elimination*).

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The items listed as collected from Scene A, Scene B, and Norfolk Street also differ in optical properties from the Q850.1 and Q852.1 pieces of tape from Belmont Street. Therefore, neither Q850.1 nor Q852.1 originated from the same roll of tape as the others (*Elimination*).

The Q183.2 pieces of tape from Scene A differ from the other pieces of tape from Scene A as well as the pieces of tape from Scene B and the Medical Examiner's office. Therefore Q183.2 does not share a common source roll with those other pieces (*Elimination*).

Q125.3.1 was isolated from Q125.3 and chosen as representative of Scene B, Q268.1.1.1 was isolated from Q268.1.1 (Medical Examiner's Office), Q460.1.1 was isolated from Q460.1 and chosen as representative of the like tapes from Scene A, and Q635.2 was chosen as representative of Laurel Street. These items were comprehensively compared to the Cohere™ brand rolls of tape from the Norfolk Street Apartment (Q684.2, Q686, and Q695). Based on these examinations, Q125.3.1, Q268.1.1.1, Q460.1.1, Q635.2, Q684.2, Q686, and Q695 are indistinguishable in physical and optical characteristics and chemical composition. Therefore, Q125.3.1, Q268.1.1.1, Q460.1.1, and Q635.2 originated from one of the Q684.2, Q686, and Q695 rolls of tape or a different roll(s) manufactured in the same manner (*Level III Association*). This conclusion was reached because other rolls of tape produced at the same manufacturing plant and with the same specifications would also be indistinguishable from these items. However, packaging tape industry representatives have indicated that the Cohere™ brand of packaging tapes are not readily available in the North American market, with the exception of internet purchases.

The following analytical techniques were utilized in the examination of the packaging tapes: visual and stereomicroscopical observations, polarized light microscopy (PLM), physical measurements, FTIR, and py-GC/MS.

#### *PTFE Tape Examinations*

PTFE tapes are generally comprised of a single polymeric layer without an adhesive. They are commonly referred to by the brand name Teflon®.

Items Q583.2 and Q584.3 from Laurel Street were identified as pieces of PTFE that appear to have been used, based on their general appearance, deformation, and stretching. Due to this deformation and stretching, Q583.2 and Q584.3 could not be compared to Q725.4 (Norfolk Street apartment) and Q792-Q792.3 (Vassar Street in Cambridge), which are five rolls of PTFE tape of various widths and lengths. However, Q583.2, Q584.3, Q725.4, and Q792-Q792.3 were all identified as PTFE.

The following analytical techniques were utilized in the examination of the PTFE tapes: visual and stereomicroscopical observations, FTIR, and py-GC/MS.



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### *Friction Tape Examinations*

The Q74 and Q779 items were both black friction tapes. Friction tapes generally consist of a cloth backing that is impregnated with a rubber-based adhesive. A typical use is on athletic equipment for improving one's grip. Since they were both recovered from Scene A, they were not compared to each other.

### *Paper Tape Examinations*

The Q42.7 and Q680.1 items are white paper tapes (i.e., a paper backing with an adhesive) of different widths, and the tape from Q852 is brown paper tape. Therefore, Q42.7 and Q852 do not share a common source, nor did they originate from Q680.1 (*Elimination*).

### *Other Examinations*

The Q76 item was a multi-layered polymeric material that physically differs from the other items in the case. Therefore, it was not examined further.

The Q702 bottle of glue differed from the polymers previously analyzed for Scene A, Scene B, the Medical Examiner's office, and Laurel Street. Therefore, Q702 is not the source of the previously analyzed polymers (*Elimination*). A detailed listing of the comparison items can be found in the FBI Laboratory report dated July 24, 2013, authored by Forensic Examiner Andria Mehlretter. Visual and stereomicroscopical observations and FTIR were utilized in the examination of this item of evidence.

### **Interpretation:**

Based on the reported results, more than one type of tape was recovered from and concluded to be indistinguishable between the various scenes. These findings may increase the significance of the reported results.

The following descriptions are meant to provide context to the levels of opinions reached in this report. Every level of conclusion may not be applicable in every case nor for every material type.

*Level I Association:* A physical match; items physically fit back to one another, indicating that the items were once from the same source.

*Level II Association:* An association in which items are consistent in observed and measured physical properties and/or chemical composition and share atypical

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characteristic(s) that would not be expected to be readily available in the population of this evidence type.

*Level III Association:* An association in which items are consistent in observed and measured physical properties and/or chemical composition and, therefore, could have originated from the same source. Because other items have been manufactured that would also be indistinguishable from the submitted evidence, an individual source cannot be determined.

*Level IV Association:* An association in which items are consistent in observed and measured physical properties and/or chemical composition and, therefore, could have originated from the same source. As compared to a *Level III Association*, items categorized within a *Level IV* share characteristics that are more common amongst these kinds of manufactured products. Alternatively, an association between items would be categorized as a *Level IV* if a limited analysis was performed due to the characteristics or size of the specimen(s).

*Level V Association:* An association in which items are consistent in some, but not all, physical properties and/or chemical composition. Some minor variation(s) exists between the known and questioned items and could be due to factors such as sample heterogeneity, contamination of the sample(s), or having a sample of insufficient size to adequately assess the homogeneity of the entity from which it was derived.

*Inconclusive:* No conclusion could be reached regarding an association/elimination between the items.

*Elimination:* The items were dissimilar in physical properties and/or chemical composition, indicating that they did not originate from the same source.

**Remarks:**

The Q52.6 item was isolated in the Chemistry Unit but not analyzed.

The disposition of the items listed will be the subject of a separate communication.

The supporting records for the opinions and interpretations expressed in this report are retained in the FBI files.

For questions about the content of this report, please contact Forensic Examiner Andria Mehlretter at (703) 632-7415.

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For questions about the status of your submission, including any remaining forensic examinations, please contact Request Coordinator Edward Knapp at (703) 632-7644.

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Chemistry Unit

Technically reviewed and identifications and associations confirmed by:

 Date: 12/17/13

Administratively reviewed by:

 Date: 12/23/13

This report contains the opinions/interpretations of the examiner(s) who issued the report.

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